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In re Application of:	Baoguo Yang, et al.
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Group Art Unit:	2634
Title:	SYSTEM AND METHOD TO PERFORM DC COMPENSATION ON A RADIO FREQUENCY BURST IN A CELLULAR WIRELESS NETWORK

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Robert A. McLauchlan

AMENDMENT

Dear Sir:

Applicant hereby responds to the Office Action mailed August 2, 2005. Applicant respectfully requests the Examiner reconsider the rejections of the Claims in view of the following amendments to the Claims and comments as set forth below.

Please replace paragraph [0002] of the application on file with paragraph [0002] on page 2 of this Amendment.

Please replace paragraph [0010] of the application on file with paragraph [0010] on page 3 of this Amendment.

Please replace paragraph [0058] of the application on file with paragraph [0058] on page 4of this Amendment.

Please replace paragraph [0059] of the application on file with paragraph [0059] on page 5 of this Amendment.

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[0002] The present invention relates generally to cellular wireless communication systems, and more particularly to a system and method to perform direct current (DC) compensation on a radio frequency (RF) burst in a cellular wireless network.

[0010] In order to overcome the shortcomings of prior devices, the present invention provides a system and method to perform DC compensation on a radio frequency (RF) burst transmitted between a servicing base station and a wireless terminal in a cellular wireless communication system. This method involves receiving the RF burst and converting the RF burst to a baseband signal. Typically, each data block contains 4 radio frequency (RF) bursts, where each of the 4 RF bursts uses the same modulation format. The RF burst is modulated according to either a first modulation format or a second modulation format. Such modulation formats may be GMSK, 8PSK, or other like modulation formats known to those skilled in the art. Samples from a baseband RF Burst are produced and averaged to produce a DC offset estimate. The DC offset estimate is then subtracted from each of the samples. The baseband RF Burst may include both In-phase (I phase) and Quadrature phase (Q phase). Samples from each phase are averaged to produce individual I phase and Q phase DC offset estimates. The modulation format of the RF burst may then be identified from the samples. Depending on the identified modulation format, the DC offset estimate may be re-added to the samples when a particular modulation format is identified as the modulation format of the RF burst. This decision is made based on how well various components within the wireless terminal perform DC offset compensation. For example, if the modulation format is 8PSK, the SNR/SIR of the burst received by the mobile is usually high and the RF front end satisfactorily performs DC offset compensation. Thus additional compensation by the baseband processor is not required. The compensation performed by the baseband processor is undone by re-adding the DC offset estimate to the samples.

[0058] FIG. 9 illustrates a first embodiment of step 804. In this embodiment, the training sequence is extracted from the RF burst. This involves de-rotating each symbol with the rotation frequency of the first modulation format, e.g., GMSK as shown in step 902. The CIR is estimated based on the de-rotated training sequence, and the channel energy is generated based on the estimated CIR assuming the first modulation format in step 904. The channel energy may be accumulated with the channel energies of prior bursts of the same data block to produce an accumulated channel energy in step 906. Next, the training sequence is processed assuming a second modulation format in steps 908, 910 and 912. This involves de-rotating each symbol of the training sequence_with the rotation frequency of the second or alternative modulation format beginning with step 908. For example, 8PSK may be used in the second case. The CIR is estimated based on the de-rotated training sequence, and the channel energy is generated based on the estimated CIR assuming the second modulation format in step 904._The channel energy may be accumulated with the channel energies of prior bursts of the same data block to produce a second accumulated channel energy in step 912. In step 914, a determination as to which modulation format resulted in a greater channel energy or accumulated channel energy. The modulation format corresponding to the greater accumulated channel energy is then selected as the modulation format of the RF burst(s). At the first RF burst of the data block, the two channel energy accumulation registers are reset as 0.

[0059] FIG. 10 illustrates a second embodiment of step 804. This involves de-rotating each symbol in the training sequence with the rotation frequency of the first modulation format, e.g., GMSK as shown in step 1002. A first channel estimate is produced in step 1004 based upon the de-rotated training sequence first modulation format, e.g., GMSK. The first channel estimate is then applied to a reference training sequence of the first modulation format to produce a first reconstructed training sequence at step 1006. The first reconstructed training sequence is compared to the de-rotated training sequence to determine an error magnitude associated with the RF Burst in step 1008. The error magnitude may be accumulated with the error magnitudes of prior bursts of the same data block to produce a first accumulated error magnitude in step 1010. Next, each symbol is de-rotated ~~each symbol~~ in the training sequence with the rotation frequency of a second modulation format, e.g., 8PSK as shown in step 1012. A second channel estimate is then produced based upon the received training sequence assuming the second modulation format, e.g., 8PSK, at step 1014. The second channel estimate is then applied to the second modulation format's reference training sequence to produce a second reconstructed training sequence at step 1016. The second reconstructed training sequence is compared to the de-rotated training sequence to determine an error magnitude associated with the RF Burst in step 1018. The error magnitude may be accumulated with the error magnitudes of prior bursts of the same data block to produce a second accumulated error magnitude in step 1020.